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ABSTRACT

The Delaware Educational Assessment Program publishes annual results from the California Test of Basic Skills by district, school, and grade (1 through 8 and 11). A statewide computer information system was developed to manage the testing program, the massive 10-year longitudinal database, and the information requests received. The Delaware Educational Assessment Management Information System (DEAP-MIS) now provides direct interactive access to statewide test results by any school administrator or teacher in Delaware. Student information includes personal data, subtest scores, and item response information for each objective. DEAP-MIS was intended to provide useful information to responsible officials, school staff, constituents, and the researchers. On-line help programs and statistical packages to assist in decision making were also made available. After three years of implementation, it was concluded that (1) DEAP-MIS was used primarily by middle-management supervisory staff, principals, and their clerical staff; (2) greatest use occurred after new test scores were added; (3) very few local staff were independent users of the system; (4) requests for state-level assistance increased; and (5) information was used mainly for acquiring facts, informing others, and complying with regulations. (GDC)

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INFORMATION POWER: USE IT OR LOOSE IT

Reflections On The Development And Use Of A Statewide Assessment Information System

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ABSTRACT

This paper was part of a 1986 American Educational Research Association (AERA) Conference symposium entitled, "----------al Management Systems: Making INSTRUCTION Visable Again". It examines the use of a state-wide information system which supports the Delaware Educational Assessment Program. This system is networked to virtually every school district and every school in the state. The designers of this system did not anticipate the lack of readiness of instructional and management staff to deal with the information which suddenly became available to them. The fact that it is used by a small portion of its potential prompted the author to seek out why school staff did not take advantage of this resource. As like systems proliferate, they will probably encounter and overcome similar technological problems; however, this paper illuminates far more pervasive problems in the interpretation and use of the information that these systems deliver.

INTRODUCTION

The Delaware Educational Assessment Program (DEAP) was mandated in 1978 as a ten-year program to report the achievement progress of Delaware public school students in grades 1 through 8 and grade 11. Annual test results from a nationally standardized test (eg., CTBS) must be publicly reported by district, school and grade; individual student results must be reported to parents. Also, longitudinal test results must be available for each student and are aggregated for specific target groups across the ten-year testing program. Furthermore, each local school district must provide a school-by-school needs analysis and curriculum plan based upon the test results in their annual report to the General Assembly. However, every year there are many more requests for the information generated by this program than were originally conceived by those who drafted the basic-skills "accountability" legislation.

Remote-batch computer resources were primarily allocated to manage the logistics of test materials distribution and maintain the massive longitudinal database produced from the annual statewide test administrations. This early management support system enabled state-level assessment staff to:

* Provide inventory control and security of DEAP test materials distributed to participating schools.

* Identify and track the school and grade locations of all Delaware public school students to facilitate test administration and quality control of test scoring.

* Produce test reports by item, objective and subtests for requested groups (eg., district, school, grade, classroom or unique instructional groups).

* Update, equate and maintain the annual and longitudinal database of test results for students and schools.

* Support research related to student and school information contained in the DEAP databases.

The "flexible reporting services" produced by this system created an increasing number of requests for assessment information to be provided for specific target groups (eg., Chapter I, Special Education, etc.) and longitudinal reports of achievement progress. In turn, this put pressure on the assessment program staff to spend more of their time responding to requests for information than to manage the testing program. Furthermore, the increased number of requests resulted in proportional increases in the average turnaround time for producing the reports by the assessment staff. Thus, it was soon apparent that the statewide test results had to be made available for direct access by local practitioners in a manner that would assure timely reporting and at the same time would insure the proper security and integrity of the DEAP database.

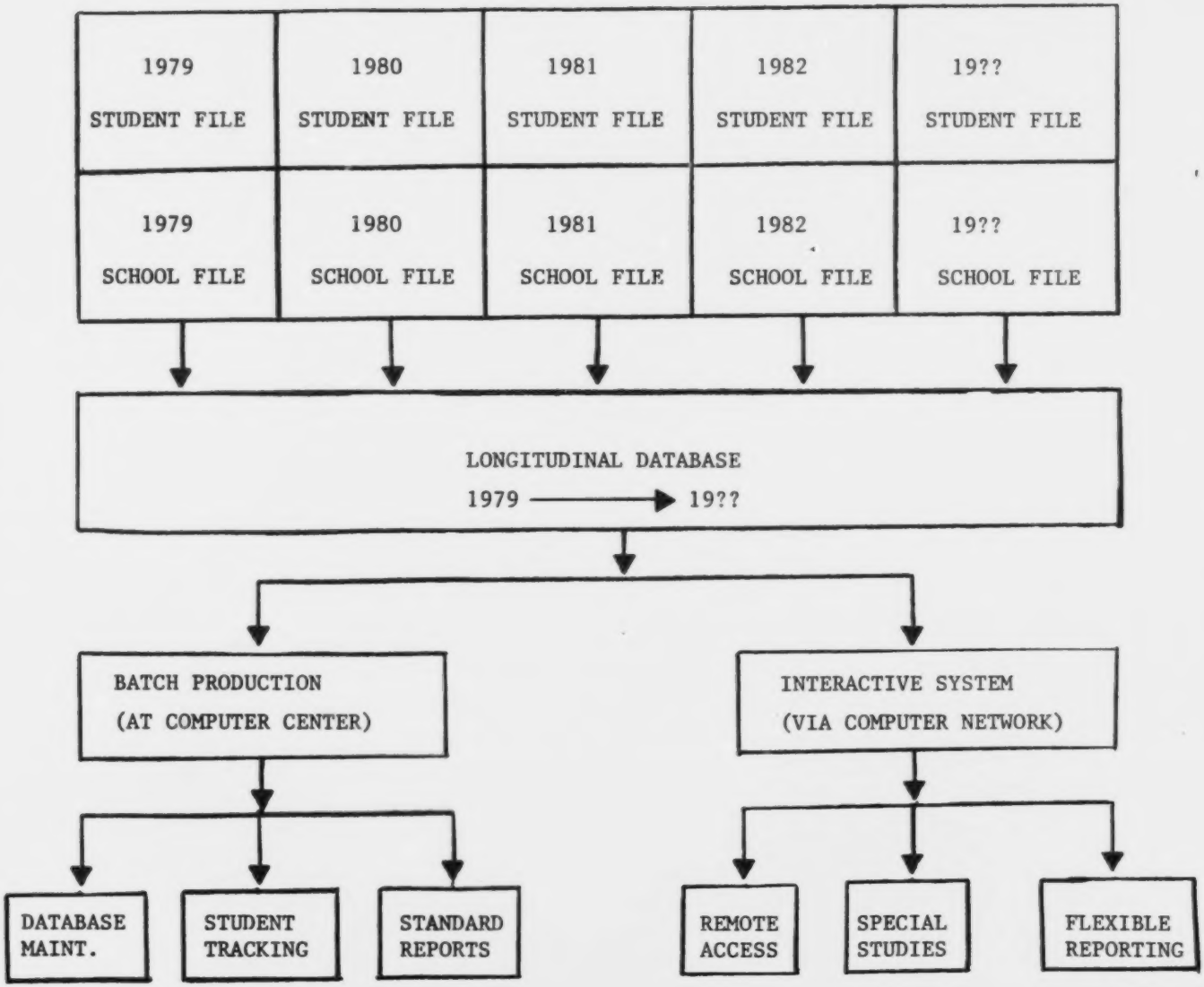
This paper is an informal discussion of some problems encountered and discoveries made during the implementation of the Delaware Educational Assessment Management Information System (DEAP-MIS) which provides direct interactive access to statewide test results by any school administrator or teacher in Delaware. After a brief description of its operating components, the emphasis will be upon the nature of user response to the system and how well it seems to meet user information needs.

DESIGN CONSIDERATIONS

System Configuration

The longitudinal structure of the database was a response to the legislative mandate that school and student achievement progress be the primary focus of the statewide testing program. Figure 1 illustrates that the DEAP database is constructed from multiple subfiles of the standardized test results from all public school students who participated in each annual administration of the statewide tests over the past eight years. Each student record contains personal identification information; district, school and grade enrollment information; special education status; subtest scores (eg., raw scores, percentiles, NCE's, scale scores); and item response information for each objective measured. The annual files are relational so that student records can be linked across years via their student tracking ID code. The enrollment information includes grade, school and district codes which allows for trend analyses of these standard aggregates as a longitudinal reporting feature of the statewide testing program.

A statewide telecommunications network links every public school in the state to a Digital VAX 11/785 computer with sufficient memory and disk space to handle over 50 simultaneous users on a time-share basis. Annual charges for this system are minimal since all telephone calls to the mainframe are through local multiplexors; the yearly subscription fee is less than $2,500.00 per school. School-based users can also access and utilize a variety of other database management and statistical packages through the network.



DEAP-MIS COMPONENTS

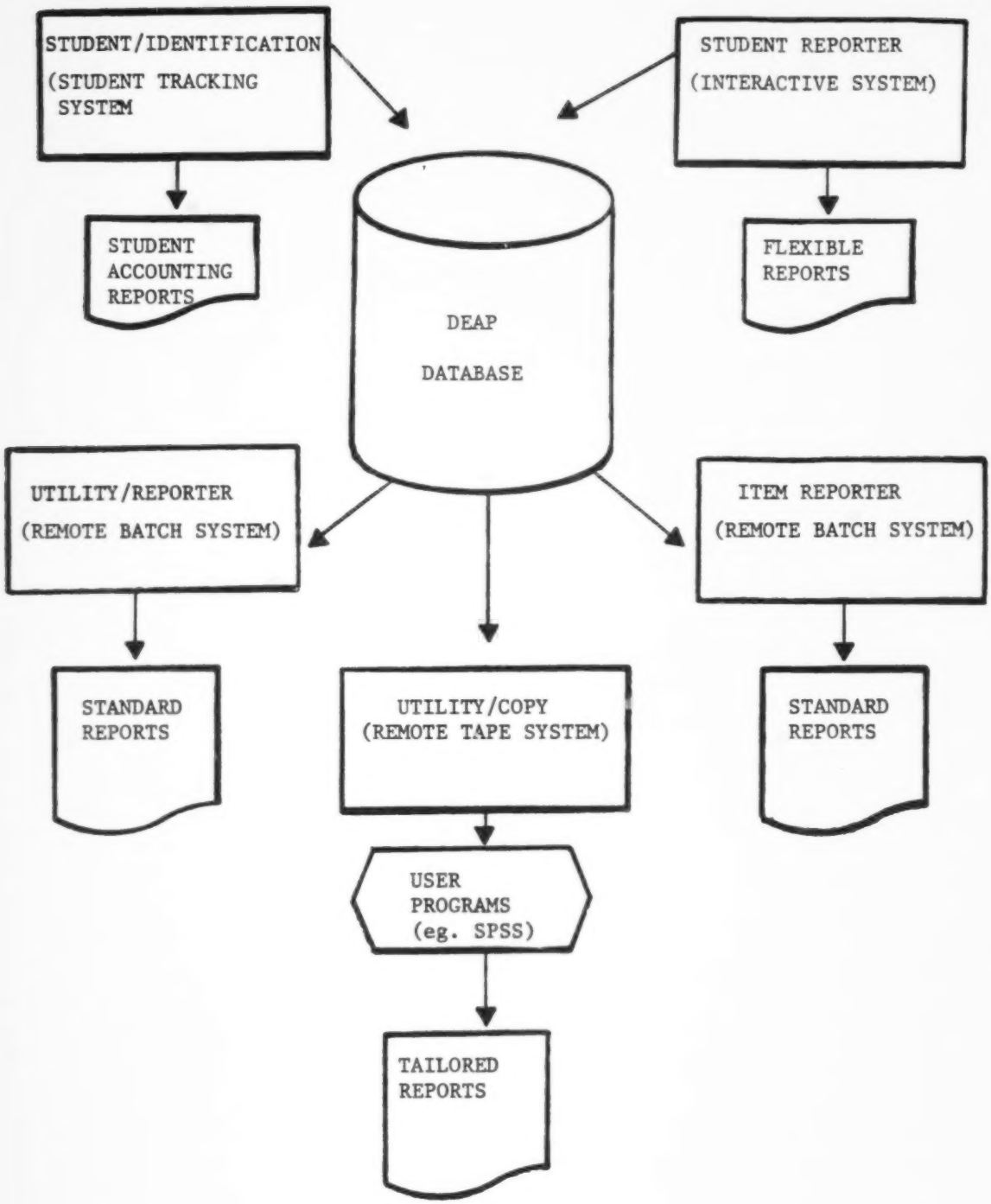
Figure 1

The DEAP-MIS software is a collection of batch and interactive modules that can be accessed from remote locations anywhere in the state. Figure 2 indicates the variety of software available to all schools to analyze and report their test results and other student information. Note that all reports can be generated via remote batch and interactive systems to allow for wide variation in school district peripheral equipment. For example, a school's student score rosters can be locally reviewed on a CRT and then dumped to a high-speed site printer for a permanent, hard-copy record. Both remote-batch and interactive software modules are command driven with an extensive, online help menu.

Multiple levels of security are utilized with the DEAP database. Access to the DEAP software is through a two-level password procedure. Users can examine only the records of students currently enrolled in their school building. In fact, each data element in the student records can be controlled through the DEAP-MIS software and VAX operating system. Furthermore, a user log subsystem continuously monitors user interactions with the DEAP-MIS and flags any attempts to break the password codes in school accounts. Finally, these files contain "read-only" information; this means that the student files are updated or changed only through central batch procedures.

User needs

To be effective, the DEAP-MIS had to meet user needs in terms of their (1) decision-making roles, (2) abilities to obtain and



DEAP-MIS SOFTWARE

Figure 2

apply the information, and (3) potential uses of the information itself. Borrowing from the schema proposed by Cronbach, et. al. (1980, Page 102) the two broad constituencies for determining policy in Delaware are the public servants and the public. The major roles within the policy-shaping community are:

I. Public Servants

A. Responsible Officials

1. Policy Level
2. Program Level

B. Operating Level

II. The Public

A. The Constituents
B. The Illuminator-Researcher

It was determined that the information produced via the DEAP-MIS should be immediately useful to responsible officials at both the program and policy levels. The annual testing information and longitudinal trends of student achievement are utilized by local school staff to determine basic skills needs for specific target groups and developing priorities for district-wide educational programs. In contrast, federal and state program staff use the assessment information to determine the achievement progress of their own students toward summative curricular objectives.

Also, it was felt that information from the DEAP-MIS should be available to the policy-shaping community and program staff via the important role of the Illuminator-Researcher. This person can provide new or enriched perspectives on educational issues and translate information about them to other members of the policy and

management groups. One critical function of the Illuminator-Researcher is to meet the information needs of two types of decision makers which seem to prevail among Delaware policy and program level officials (1) those who employ an analytic approach to making decisions and (2) those who take a more pragmatic view. Analytic decision makers require information which allows better understanding of the components of the problem to be solved and logical comparisons of alternate solutions. On the other hand, pragmatic decision makers need information about the anticipated social and material results of recommended solutions. Thus, the Illuminator-Researcher must provide both policy and operations groups with information which can be used to explain "what is" and predict "what if".

The need for a substantial user training component was projected during the early developmental stages of the DEAP-MIS. Evidence from field tests of the inquiry routines and standard report generators indicated that while most school administrators and teachers could quickly learn the simple command procedures to access the information, most had difficulty in correctly interpreting and using it. This prompted the development of an extensive on-line "help" program and field service efforts to encourage the correct applications of the assessment information obtained from the system.

From our earlier experiences with batch reporting; we were wary of the propensity for most local users to want the system to make decisions for them. A simple example of this was the use of

high-low sorts of reading scores to assign students to instructional groups in the face of state and district policies to use a combination of diagnostic, norm-referenced and teacher judgement information to make this determination. This prevailing concept of "the computer as decision-maker" encouraged us to plan interfaces with other student databases and to make standard statistical packages available for further analyses of the assessment information generated via the DEAP-MIS.

Over a five year period, we developed user routines which support the potential uses of the assessment information by policy and program-level staff. It is convenient here to apply Mary M. Kennedy's categories (1984, Page 209) to describe these uses:

I. Individual conceptual use

   A. Acquiring factual knowledge
   B. Drawing inferences and conclusions

II. Uses in group interactions

   A. Informing others
   B. Persuading others
   C. Supervising others
   D. Responding to others

III. Direct applications

   A. Complying with regulations
   B. Sorting and placing children
   C. Miscellaneous

Also, we were well aware that the kind of information which was needed most by our users would probably be produced under pressure of time constraints and was concerned with the immediate world of action. This echoed the differentiation between conclusion-oriented

vs. decision-oriented research made by Cronbach and Supples almost two decades ago (1969).

HOW WELL IS THE DEAP-MIS BEING UTILIZED?

After three years of full implementation, it is time to reflect upon the major effects of our assessment information system. At the outset we naively assumed that by making information readily available, it would be used more often by more people. We also anticipated that the information itself would create demand for further information applications to make decisions about school children. Finally, we looked forward to some improvement in the competence of school staff to apply the information to identify student needs, propose instructional solutions, and come to conclusions about their educational programs.

The following generalizations were developed from observing the use of the DEAP-MIS in many school locations and from our user log files:

1. <u>The majority of persons who access the DEAP-MIS are either middle-management supervisory staff, principals or their clerical assistants</u>.

Very few chief administrators or classroom teachers take the time to access their own databases. This finding points toward the traditional roles of school personnel in dealing with (or avoiding) test data. Computer terminals which access our network are still found in central office locations; not in classrooms or work areas for instructional staff. Also, we have found that upper-level managers tend to think of the access and manipulation of test data

as primarily a clerical job and will delegate the generation of even the shortest student report or summary distribution of school scores to a secretary or aide. On the other hand, these same managers will spend hours with a spreadsheet program to balance their petty cash fund on a small capacity PC.

2. Frequency of use tends to be seasonal, that is, the greatest frequency of multiple uses occurs immediately after the new test scores are added; the lowest frequency of use occurs just before the annual test administration.

The timeliness of the DEAP-MIS data does, indeed, affect its use by school staff. Also, parent pressure to review or challenge their children's results is greatest soon after schools receive their test scores. Even though the student enrollment information is updated with grade-to-grade promotions over the summer, the raw frequency of access is directly related to the recency of the test score information. In other words, to increase local staff inquiries to their assessment database, we would have to administer more tests; not necessarily make old test information more available.

3. Very few local staff have become independent users of the interactive and batch software.

Even after repeated inservice sessions and individualized attention, school-based users tend to "start from scratch" when they access their new testing data. It appears that our software requires constant practice to assure continuous use. The online help routines are used heavily by new users and by those who have not accessed their data for a month or more. Also, the assessment field staff constantly marvel at how quickly users forget the simplest of commands. It now seems that we must shift to completely menu-driven routines to encourage independent access of our assessment data.

This will require software revisions at a fairly large cost to promote flexibility for alternative applications.

4. Requests for State-level assistance and batch reporting services have increased, not diminished, with local school availability of the DEAP-MIS.

The increased availability of assessment information has stimulated further requests for information by school staff. However, they will tolerate the use of archaic input documents, more paperwork and increasing turnaround times for reports from state assessment staff in lieu of spending one-tenth of the person hours on their own equipment with immediate output. This reinforces the dissonance between "teacher vs. data manager" job roles that was mentioned earlier. Also, it was interesting to note that those who obtain assessment information from their own site equipment tend not to share it with others, but instead, use it to further their own work assignments (or job status).

5. The information obtained through the DEAP-MIS by school managers and illuminator-researchers is mainly used for acquiring factual knowledge, informing others, and complying with regulations; very seldom is the assessment information used to draw inferences or conclusions.

This finding seems to support the notion that Delaware school people use our assessment information for conceptual rather than instrumental uses (see Kennedy, Page 207). That is, our information is valued for understanding or clarifying status rather than to support pro-active decisions about programs or students. We believe that this is not unique to the DEAP-MIS but also to the uses of other information systems by public educators. We have seen very little evidence that our school people spend a lot of time making

rational decisions based upon our assessment information. Instead, it appears that they look for decisions to leap from the database at the push of a button; when this does not occur, they discontinue their search for solutions. A prime example of this phenomena is the apparent avoidance of achievement-trend studies by our policy-level staff or the dearth of program evaluations which utilize the extensive DEAP longitudinal database.

CONCLUSIONS

It is apparent from findings beginning to emerge from the implementation of our assessment information system that we will have to focus more upon "human-information" rather than "human-machine" interfaces. That is, we should evaluate the utility of our assessment information for local school staff in terms of their application needs. Also, we should look at more effective ways to provide professional assistance to our school people to help them interpret and use the information correctly in their own school context. In this manner, we could encourage use of our assessment information to its fullest potential; not loose it from non-use.

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